

ERIE CANAL (ORIGINAL), LOCKS 37 & 38  
(Harmony Mills Picker House and Storehouse No. 1)  
(City of Cohoes Water-Works Pump House)  
Harmony Mills  
84 North Mohawk Street  
Cohoes  
Albany County  
New York

HAER NY-337  
*HAER NY-337*

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

REDUCED COPIES OF MEASURED DRAWINGS

FIELD RECORDS

HISTORIC AMERICAN ENGINEERING RECORD  
National Park Service  
U.S. Department of the Interior  
1849 C Street NW  
Washington, DC 20240-0001

## HISTORIC AMERICAN ENGINEERING RECORD

### ERIE CANAL (ORIGINAL), LOCKS 37 AND 38 (Harmony Mills Picker House and Storehouse No. 1) (City of Cohoes Water-Works Pump House)

HAER No. NY-337

**Location:** 84 North Mohawk Street, Cohoes, Albany County, New York  
Erie Canal Locks 37 and 38 are located at latitude 42.782458, longitude -73.706658. These coordinates represent the northeast corner of the pump house atop Lock 37.

**Present Owner:** Uri Kaufman (picker house and storehouse)  
City of Cohoes (pump house)

**Present Use:** Sewer-pipe tunnel surmounted by partially vacant industrial buildings

#### **Significance:**

The state of New York built the Erie Canal between 1817 and 1825 to open the western part of the state and the Great Lakes to settlement and commercial development. Locks 37 and 38 formed part of a series of nineteen locks needed to carry the canal around the Cohoes Falls, a cataract on the Mohawk River some three miles above its junction with the Hudson River. After the completion of an enlarged Erie Canal along a new line through Cohoes in 1842, the original right of way was conveyed to the Cohoes Company and incorporated into the expanding system that supplied water power to manufacturers throughout the growing community.

The Erie Canal catalyzed commerce, industry, and population growth in Cohoes, as it did in places all along its path. Although little survives of Locks 37 and 38, portions now serve as foundations for a row of industrial buildings that demonstrate Cohoes' expansion as a mill town through the middle decades of the nineteenth century. Largely functional and quotidian, these buildings and the canal beneath them were modified as needed over time to maintain their usefulness, and the resulting site is an accretion at the center of a larger manufacturing complex where the paths of a few leading nineteenth-century engineers and capitalists crossed those of thousands of predominately young and immigrant mill workers.

The power-canal system was abandoned after 1915 and the adjacent mills closed in the 1930s. Today, the remains of Locks 37 and 38 and the buildings above them lie within the Harmony Mill Historic District, created in 1978, and the Harmony Mills National Historic Landmark District, designated in 1999.

**Historian:** Michael R. Harrison, 2011

## **Project**

**Information:** The Erie Canal Locks 37 and 38 project was undertaken by the Historic American Engineering Record (HAER) with sponsorship from the City of Cohoes, New York. HAER, a program to document historically significant engineering and industrial works in the United States, is part of Heritage Documentation Programs (Richard O'Connor, manager), a division of the National Park Service, U.S. Department of the Interior. Christopher Marston, HAER architect, served as project manager. Jeremy Mauro, HAER contract architect, produced the measured drawings. HAER photographer Jet Lowe produced the large format photography, Jami Babb collected GIS data, and historian Michael R. Harrison wrote the historical report. Special thanks to Duncan Hay, Craig Williams, Ed Tremblay, Walter Lipka, and Steve Lackmann for sharing their knowledge of the site and the Erie Canal with the project.

**Related Projects:** For additional information on the Erie Canal and the industrial heritage of Cohoes, N.Y., see the following related HAER documentation:

Erie Canal (Enlarged), Schoharie Creek Aqueduct, HAER NY-6  
Erie Canal (Original), Empire Lock Number 20, HAER NY-545  
Erie Canal (Enlarged), Lock Number 18, HAER NY-11  
Erie Canal (Enlarged), Empire Lock Number 29, HAER NY-17  
New York State Barge Canal Locks E2 to E6 [the Waterford flight],  
documented individually as HAER NY-371, NY-372, NY-375, NY-376, and  
NY-377  
Harmony Manufacturing Company, Mill Number 3, HAER NY-5  
Cohoes Company Power Canal System, Level 2, HAER NY-9  
Cohoes Company, Gate House No. 1, HAER NY-8

## **Part I. Historical Information**

### **A. Physical History**

**1. Dates of construction:** Construction of Locks 37 and 38 on the original Erie Canal began about 1821 and was completed by October 1823, when the portion of the canal from Rochester to Albany opened to traffic. The picker house that sits above Lock 38 was built in 1853. The

pump house above Lock 37 was built in 1858. The storehouse between the picker and pump houses was built in 1864.<sup>1</sup>

**2. Engineer:** The designer of Locks 37 and 38 is uncertain, but it may have been Canvass White, who was heavily involved in surveying on the canal and oversaw aspects of the construction on its middle and eastern divisions. He is commonly credited with designing many of the canal's "mechanical structures."<sup>2</sup>

Canvass White (1790–1834), like the other engineers on the Erie Canal, had no professional engineering training. As a teenager he studied mathematics, surveying, astronomy, mineralogy, and chemistry at the Fairfield Academy in Herkimer County, New York, and in 1816 and 1817 he assisted Benjamin Wright in making the final surveys of the route for the Erie Canal. The next year he traveled to Britain at his own expense to see and study the English canal system, and the observations and surveying instruments he brought back greatly aided the construction in New York. In 1818, he became assistant engineer on the canal's middle division, and in 1820 and 1821 he made a final resurvey of the route between Schoharie and Albany – the section that included Cohoes. In 1822, he laid out the channel and locks of the Glens Falls feeder on the Champlain Canal as well as the "State Dam" and guard locks that created the slack-water crossing for the Champlain Canal near the mouth of the Mohawk, a short distance downstream from the Cohoes Falls. He was subsequently involved in the construction of the Erie Canal's eastern division. Elsewhere, White planned and supervised construction of portions of the Lehigh (1827–28), Delaware and Raritan (1825, 1830), Schuylkill, and Union canals in Pennsylvania and New Jersey and the New Haven and Farmington Canal in Connecticut. The best known of White's many contributions to the creation of the Erie Canal was his development of an effective hydraulic cement based on a domestic limestone, which saved the canal commissioners the great expense of importing English cement to secure and seal the

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<sup>1</sup> Noble E. Whitford, *History of the Canal System of the State of New York together with Brief Histories of the Canals of the United States and Canada*, vol. 1 (Albany: Bradow Printing Company, 1906), 113; *Laws of the State of New York, in relation to the Erie and Champlain Canals together with the Annual Reports of the Canal Commissioners, and other Documents . . .* (Albany: E. and E. Hosford, printers, 1825), 2:174 [hereafter cited as *Canal Laws*]; W. A. Young, surveyor, *Harmony Mills. Nos. 1, 2, 3, & 4 Mills. Cohoes, N.Y.*, serial no. 13126 (Boston: Associated Mutual Insurance Company, July 11, 1918 with revisions to Sept. 19, 1928), copy in City of Cohoes engineer's office; Arthur H. Masten, *The History of Cohoes, New York, from its Earliest Settlement to the Present Time* (Albany: Joel Munsell, 1877), 179; "Water Commissioners' Report," *Cohoes Cataract*, Apr. 16, 1859, 3.

<sup>2</sup> Whitford, *History of the Canal System*, 791. Whitford writes that "To White was committed the duty of making the plans for all the mechanical structures on the canal," but this may be an exaggeration as White was out of the country when many of the initial construction contracts were awarded.

canal's masonry work. He received two patents for his cement discoveries in 1820 and 1821 and profited from factories he and his brother Hugh established to produce the material.<sup>3</sup>

**3. Builder/ Contractor:** The contractor for Locks 37 and 38 is uncertain but Lock 37 may have been built by one Peter Stewart. The canal commissioners let a contract to John Watson and Edward Learned in late 1821 for the construction of "four locks on the Erie Canal near the Cohoes falls to be located next above the Lock let to Peter Stewart." The only discrete group of four locks near the falls was the group next above Lock 37. If Watson and Learned built these locks (nos. 33-36), which seems probable but is not certain, then presumably Stewart built Lock 37.<sup>4</sup>

Watson and Learned's contract refers to Peter Stewart's "Lock," but state comptroller's reports note multiple payments to "P. Stewart" for "locks" constructed between 1822 and 1824, making it conceivable that Stewart built Lock 38 as well. While Lock 37 was built in limestone, historical sources note that Lock 38 and the group of three locks next downstream from it (nos. 39-41) were built of marble and were known as "the 4 Marble Locks," facts suggesting they were constructed together under a single contract. Although Watson and Learned's four locks might conceivably be the four Marble Locks, these men were paid \$1,000 per foot of lift, the standard rate for limestone locks, not the higher marble rate. The \$56,236 paid to P. Stewart, however, would easily have covered four marble locks and one limestone lock, so it is plausible that Stewart might have built both Lock 37 and Locks 38 to 41.<sup>5</sup>

No records have been found indicating the architect and builder for the 1853 Harmony Mills picker house above Lock 38 and the 1864 storehouse adjacent to it. The 1858 water-works pump house above Lock 37 was built by carpenter Philo B. Ferguson and mason John McEnerny under the supervision of carpenter and builder Joshua R. Clark. Although David H. Van Auken,

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<sup>3</sup> *Canal Laws*, 2:18, 72; Masten, *The History of Cohoes*, 265-66; William Pierrepont White, "Canvass White's Services," in *Canal Enlargement in New York State*, Buffalo Historical Society Publications 13 (Buffalo: Buffalo Historical Society, 1909), 353-58; Whitford, *History of the Canal System*, 96-98; William H. Shank, *Towpaths to Tugboats: A History of American Canal Engineering* (York, Pa.: American Canal and Transportation Center, 1982), 22; Ronald E. Shaw, *Erie Water West: A History of the Erie Canal, 1792-1854* (Lexington: University of Kentucky Press, 1966), 95-96.

<sup>4</sup> John Watson and Edward Learned, contract for four locks, Oct. 10, 1821, Contracts and accounts for construction and repair, ca. 1817-1828, series A1125, box 7, New York State Archives.

<sup>5</sup> Comptroller's reports from Mar. 1823, Feb. 1824, and Feb. 1825 record payments to "P. Stewart" for "locks" of \$16,500, \$35,500, and \$4,236, respectively. No indication is given of the location of the locks paid for, nor is it certain that these entries all refer to the same P. Stewart. *Canal Laws*, 2:480, 493, 508. The "4 Marble Locks" are mentioned in Horatio Gates Spafford, *A Pocket Guide for the Tourist and Traveller Along the Line of the Canals and the Interior Commerce of the State of New-York* (New York: T. and J. Swords, 1824), 28-29.

the superintending engineer of the water works, is likely to have had a hand in the design of the pump house, no documentation survives crediting the building to him.<sup>6</sup>

**4. Original Plans:** The prism of the original Erie Canal was designed to be 28' wide at the bottom, 40' wide at water level, and 4' deep. Where changes in elevation were necessary, locks were built, and each original lock comprised a central chamber 90' long and 15' wide with a pair of timber miter gates at each end. Pockets in the chamber walls allowed the gates to open flush without protruding beyond the line of the side walls in order to prevent snags while boats locked through. Like most locks on the canal, Locks 37 and 38 were each bypassed by side culverts that helped maintain a constant level of water in the canal.<sup>7</sup>

Virginia planter Gen. John H. Cocke described the construction of the locks on the Erie Canal during an inspection tour he made in the summer of 1823:

Their locks are universally of hewn stone, and, for the most part, lime-stone, that being preferred on account of its superior durability; occasionally, the sand or free stone has been used, and in some instances marble; but, everywhere, with the exception of a few of the first built locks on the middle section, they are executed in a masterly style of workmanship, and with stone of such large dimensions, that it is not uncommon, to see the external walls of a lock of 8 feet lift, composed only of eight courses.

... [T]hey use water lime throughout the whole structure ... [and] they use stone mitre sills in place of wood; but these are subject to scale and break by the concussion of heavy boats of forty-five and fifty tons; and must be protected by a beam of timber, called a bumping piece, so placed as to defend the mitre sills from the contact of the boats....

The mode of filling and emptying the locks is universally the common one by culverts, formed in the body of the masonry, and paddle gates.<sup>8</sup>

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<sup>6</sup> David H. Van Auken became chief engineer of the Cohoes Company sometime between 1865 and 1870 and designed many of the company's improvements over the next few decades. From 1866 to 1872, he served as architect and engineer on the construction of the monumental Harmony Mill No. 3, located across Mohawk Street from the water-works pump house. He also served on the boards of numerous local companies and organizations, including the Cohoes Gas Light Company. "Water Commissioners' Report," *Cohoes Cataract*, Apr. 16, 1859, 3; Masten, *History of Cohoes*, 140.

<sup>7</sup> Whitford, *History of the Canal System*, 798. The by-pass culverts are shown on most early surveys and maps of the canal.

<sup>8</sup> John H. Cocke to Randolph Harrison, June 17, 1825, and Cocke to Harrison, Aug. [ ], 1823, reproduced in *Eighth Annual Report of the President and Directors of the Board of Public Works to the General Assembly of Virginia, Seventeenth December, 1823* (Richmond: Shepherd & Pollard, 1824), 199-205.

Locks 37 and 38 each provided a lift of 9' for a combined lift of 18'.<sup>9</sup>

**5. Alterations and Additions:** The state of New York began to enlarge the Erie Canal in 1835. In general, the state widened and deepened the existing canal prism, but through Cohoes it bypassed the original right of way with an entirely new channel, built between 1836 and 1842. The year after this new canal section was finished, the state transferred the old section to the Cohoes Company, which put it to use as part of its system of canals supplying water to power mills and factories in the village. The state retained ownership of the cut-stone blocks in the original canal's locks and bridge abutments for reuse or sale.<sup>10</sup> Consequently, much of the structure of Locks 37 and 38 was likely soon dismantled and carted away. Over time, the Cohoes Company reused the lower portions of the lock walls by placing new stone atop the surviving base courses. It also narrowed the canal prism between the locks and lined its banks with stone. Subsequent construction of buildings atop the locks led to the enclosure of the old channel with stone and brick vaults.

The Harmony Mill Company built a brick, two-story picker house for processing raw cotton over a portion of the power canal and part of Lock 38 in 1853. Some of the above-grade stones in the exterior walls of its basement story appear to be reused lock stones. The building shows many alterations and repairs to its exterior brickwork, some of which may be from expansion or reconfiguration of the building and some of which may be repairs or restorations.<sup>11</sup>

The village of Cohoes constructed a combined pump house and fire-engine house atop Lock 37 in 1858 in order to draw water for the village's new water works from the power canal. The pump house contained a pump room, a repair shop, and an office for the water commissioners on its first floor and a superintendent's dwelling on its second floor. The engine house contained a ground-floor room for the fire appliance and second-floor accommodations for the

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<sup>9</sup> Spafford, *Pocket Guide*, 28–29; Masten, *History of Cohoes*, 45.

<sup>10</sup> Masten, *History of Cohoes*, 68–69, 78.

<sup>11</sup> The construction date for the picker house is given in the margin notes of W. A. Young, surveyor, *Harmony Mills, Nos. 1, 2, 3, & 4 Mills, Cohoes, N.Y.*, serial no. 13126 [fire-insurance plat] (Boston: Associated Mutual Insurance Company, July 11, 1918 with revisions to Sept. 19, 1928), copy in City of Cohoes engineer's office.

Reports in the *Cohoes Cataract* newspaper describe a fire destroying the interior of the mill's "picker room" on April 19, 1858. "The damaged building will be immediately repaired," the paper noted, "but some time must elapse before the machinery can be replaced, as, like that destroyed, it must be imported from England. Some thirty hands are thrown out of employment." Another fire caused \$10,000 in damage to one of the mill's picker rooms on March 25, 1861. As Harmony Mills expanded, it gained multiple picker rooms, although only one seems to have been in its own separate building. So, while it is not clear that the picker house over Lock 38 was the space affected by either the 1858 or the 1861 fires, it seems a strong contender for the earlier fire, at least. "Fire at Harmony Mills," *Cohoes Cataract*, Apr. 24, 1858, 3; the second fire is noted in Masten, *History of Cohoes*, 173, who cites a report from the *Cohoes Cataract*.

fire company.<sup>12</sup> Both the interior and exterior of this building have been altered over time. Among other changes, one- and two-story additions were built along the west elevation, a one-story section at the northern end of the pump house was demolished, and the northern half of the roof was converted from gable to flat.

In 1864, the owners of Harmony Mills filled the remaining space between the water-works building and the picker house with a 40' x 150' cotton storehouse. This building originally contained two floors, but most of the loft-like upper floor was removed at an unknown date. As the company built other storehouses on its property, this building became known as Storehouse No. 1.<sup>13</sup>

Locks 37 and 38 and the channel between them now form a tunnel underneath a range of nineteenth-century buildings. The original shale bedrock bottom of this tunnel was at some date excavated out to a depth of about 6' or 7' below the original lock foundations. Two generations of sewer lines now lie in the bottom of the tunnel, covered by about 3'-4' of dirt fill.

## B. Historical Context

### The Original Erie Canal

The state of New York built the Erie Canal between 1817 and 1825 to create a navigable connection for commerce and settlement between the Atlantic and the Great Lakes. When the canal was completed, it ran 363 miles from Albany to Buffalo; along the way, eighty-three locks with a total lift of 675' managed the 570' difference in elevation between the Hudson River and Lake Erie.<sup>14</sup>

The Mohawk River cascades over of the Cohoes Falls about 3 miles above its confluence with the Hudson River. Engineers designed nineteen locks to raise the canal around this cataract, a lift of 162' over a distance of about 2.5 miles. This run of locks began south of Cohoes at "Juncta," the Erie Canal's junction with the contemporaneous Champlain Canal. Two locks just before the junction and seven locks just after it formed what became known as the Nine Locks. Numbered 51 to 43, these provided a total lift of 78'. Progressing upstream and to the west, a single lock (no. 42; lift, 8') was followed by the so-called Three Locks (nos. 41 to 39; total lift,

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<sup>12</sup> "Water Commissioners' Report," *Cohoes Cataract*, Apr. 16, 1859, 3.

<sup>13</sup> Masten, *History of Cohoes*, 179.

<sup>14</sup> The history and impact of the Erie Canal are covered in many books, including Whitford, *History of the Canal System*; Shaw, *Erie Water West*; Carol Sheriff, *The Artificial River: The Erie Canal and the Paradox of Progress, 1817-1862* (New York: Hill and Wang, 1996); and Peter L. Bernstein, *Wedding of the Waters: The Erie Canal and the Making of a Great Nation* (New York: W. W. Norton, 2005).



26'), the Two Locks (38 and 37; total lift, 18') and the Four Locks (nos. 36 to 33; total lift, 32'). Locks 41 to 38 were additionally known as "the 4 *Marble Locks*."<sup>15</sup>

The Erie Canal was built by local workmen along its entire length, and the board of canal commissioners, in overall charge of the works, engaged dozens of contractors to hire and oversee these workmen. In 1819, about a quarter of the canal's workforce was foreign-born, a high percentage considering the low number of immigrants then living in upstate New York, and the percentage only grew as work progressed. Although unskilled laborers consistently made up a large portion of the workforce, many farmers, artisans, and even merchants worked on the canal for periods of time, particularly during the economic slump of the late 1810s and early 1820s.<sup>16</sup>

While the canal engineers and commissioners designed the locks, lock contractors were responsible for hiring enough men and procuring sufficient materials to excavate the locks pits; build the lock walls, gates, and other structures; paint all wood components; and backfill around the completed lock chambers so that the finished work would "in all respects be fit for navigation." General Cocke, on his 1823 inspection tour, reported that excavation of the canal prism generally cost the state 8 cents per cubic yard. Locks were contracted at \$1,000 per foot of lift, although the marble locks in the stretch between Schenectady and Albany cost \$1,250 per foot of lift. The workmen Cocke encountered earned \$12 a month. Others earned between \$10 and \$14, depending on working conditions and labor competition.<sup>17</sup>

A surviving contract awarded to John Watson and Edward Learned for the construction of four locks "near the Cohoes falls" gave the men one year, from October 1821 to October 1822, to complete their work and promised payment at the standard rate of \$1,000 per foot of lift. For unknown reasons—design changes, contract additions, difficult site conditions, or labor or materials shortages—Watson and Learned's work lasted through both the 1822 and 1823 building seasons, and records show the state paid them a total of \$39,000 in the end. As discussed earlier, Watson and Learned's four locks were probably those next upstream from Locks 37 and 38, and the conditions of their contract and the amount of time it took their hired laborers to do the work are likely representative of lock construction in the area.<sup>18</sup>

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<sup>15</sup> Spafford, *Pocket Guide*, 28–29; Masten, *History of Cohoes*, 45, quoting the 1825 second edition of Spafford's *Pocket Guide*; Thomas X. Grasso, et al., "Canals at Cohoes: Navigation and Waterpower," *Canal History and Technology Proceedings* 26 (Mar. 17, 2007): 125.

<sup>16</sup> Sheriff, *Artificial River*, 36–43.

<sup>17</sup> Cocke to Harrison, Aug. [ ], 1823; Sheriff, *Artificial River*, 42–43.

<sup>18</sup> Receipts filed with Watson and Learned's contract document payments of \$36,000, while the state comptroller's reports list payments totaling \$39,000; John Watson and Edward Learned, contract for four locks; *Canal Laws*, 2:464, 482, 494, 504.

That portion of the Erie Canal running between the Genesee River and Albany – and the entire Champlain Canal running from Cohoes to Whitehall – opened to traffic on October 1, 1823.<sup>19</sup> The first edition of Horatio Spafford's *Pocket Guide for the Tourist and Traveller* on the canal, published the next year, noted nothing of interest adjacent to the Two Locks, although the large basin immediately downstream from them was often full with as many as thirty or forty boats overnighing there. By 1828, Oliver C. Hubbard owned a canal grocery at the Two Locks that catered to the needs of boatmen and passengers.<sup>20</sup>

Hugh White, the brother of engineer Canvass White, moved to Cohoes in April 1830 to superintend the work of the Cohoes Company (see below). He had the lumber for his own house shipped to Cohoes on the canal from Chittenango, where he had lately lived; obviously seeing an opportunity, he established a sawmill not long after arriving in Cohoes. It stood west of the upstream end of Lock 38, on a site adjacent to that now covered by the Harmony Mills picker house and storehouse. Local carpenter Sylvester Van Der Mark built the mill for White, and it went into operation in the fall of 1830. About 1832 or 1833, White took on another local carpenter, Joshua R. Clarke, as partner, and they sold the business for \$6,000 in August 1836 to the Harmony Manufacturing Company, which continued it in operation for the next decade or more.<sup>21</sup>

### The Enlarged Erie Canal

The Erie Canal was an immediate success, and congestion quickly developed at its locks. One author describes the locks through Cohoes as “an object of great dislike to travelers and boatmen, whose progress was seriously impeded by them in busy seasons when boats were numerous,” and then notes the early creation of a stage-coach line to shuttle passengers to and from Albany around the locks.<sup>22</sup>

In May 1835, after two years of preliminary surveying and planning, the New York State Legislature authorized the enlargement of the canal. The canal commissioners, limited by the available funds, proceeded to enlarge just the eastern section of the canal between Syracuse and Albany, where the congestion was felt to be most acute, and delayed improvement of the western section for a later time. The work called for expanding the prism to hold water at a 7' depth and replacing all the locks with double locks 110' long and 18' wide. Following the recommendation of engineer John B. Jervis, the commissioners decided to abandon the original route of the canal through Cohoes in favor of a new line better suited to the canal's expanded

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<sup>19</sup> Whitford, *History of the Canal System*, 88, 113.

<sup>20</sup> Spafford, *Pocket Guide*, 29; Masten, *History of Cohoes*, 44.

<sup>21</sup> Masten, *History of Cohoes*, 52, 57, 68. The mill appears as late as 1845 on maps of the area; see James Frost, *Map of Cohoes Village and Other Property Belonging to the Cohoes Company*, 1845, New York State Library.

<sup>22</sup> Masten, *History of Cohoes*, 44.

specifications. Running about  $4\frac{1}{3}$  miles—from  $1\frac{2}{3}$  miles below the Nine Locks to the head of the Four Locks above Cohoes Falls—the new path included sixteen locks in place of the original line's nineteen, and provided longer pound-reaches between the locks.<sup>23</sup>

The commissioners let the first contracts for the enlargement in the second half of 1836, and work began that year and the next. The sixteen new double locks through Cohoes, numbered from east to west 3 to 18, opened to traffic in April 1842.<sup>24</sup>

The new canal alignment passed through land owned by the Cohoes Company that the company's directors had intended to use to extend their power-canal system. In lieu of damages for taking this land, the legislature authorized the canal commissioners to convey the abandoned prism of the original canal to the company. The year after the new right-of-way opened, "deeds were duly executed," and "that part of the canal which ran east of the Harmony Mill, between the Two Locks and the Three Locks, became the second level, in the system of the Cohoes Company." The state retained ownership of the stone in the original canal's locks and bridge abutments for government sale or reuse.<sup>25</sup>

The sixteen locks of the enlarged Erie Canal in Cohoes remained in service from 1842 through 1915. In that year, they were superseded by the five large locks of the Waterford flight, part of the new Erie Barge Canal, which carried traffic around the Cohoes Falls in a wholly new alignment on the other side of the river. The old enlarged canal was abandoned; the remains of some of its locks can still be visited in Cohoes today.

### Cohoes

The present-day city of Cohoes originated as a small farming settlement in which a limited amount of small-scale industry based on water power had developed by the mid 1810s. Construction of the Erie Canal and the development of cheap water power by the Cohoes Company catalyzed an increase in population and commerce that eventually transformed the place into a major manufacturing center.

Cohoes was incorporated as a village in 1848, and the state legislature granted its residents a city charter in May 1869 that went into effect in April 1870.<sup>26</sup> Population numbers give a sense

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<sup>23</sup> Although the original nineteen locks through Cohoes could have been lengthened and doubled, the pound reaches between closely adjacent locks would have become very short, exacerbating existing problems with excessive water-level fluctuation during lock operations; Whitford, *History of the Canal System*, 145–49.

<sup>24</sup> Whitford, *History of the Canal System*, 151, 171.

<sup>25</sup> Masten, *History of Cohoes*, 68–69, 76.

<sup>26</sup> William Bean, *The City of Cohoes: Its Past and Present History, and Future Prospects* (Cohoes: The Cataract Book and Job Printing Office, 1873), 71; Samuel Rezneck, "Cohoes: The Historical Background

of the scale and timing of the town's growth through the second and third quarters of the nineteenth century:

Population of Cohoes<sup>27</sup>

1830.....150	1855 .....6,106
1835.....750	1860 .....8,800
1840.....1,850	1865 .....8,795
1845.....2,029	1870 .....15,373
1850.....4,229	1875 .....17,482

Egbert Egberts, with the brothers Timothy and Joshua Bailey, established the first power knitting factory in the United States at Cohoes in 1832, and the town grew into a major knitting center. Daniel Simmons founded an axe and edge-tool manufactory in 1834 that grew to be the largest in the state and one of the leading axe makers in the country.<sup>28</sup> By 1871, a reporter tallied "six huge cotton-mills, eighteen knitting-mills, three paper-box factories, a straw-board factory, a paper-mill, a rolling-mill, a needle factory, a pin factory, a factory where they make bobbins, another where they make cotton bats, another where they make the various harness for looms, two large foundries and machine shops, several flouring-mills, a bedstead factory, a large sash and blind factory, and a large ax factory. Of these the cotton-mills stand pre-eminent."<sup>29</sup>

The reporter failed to make clear that the six "pre-eminent" cotton mills were, in fact, all parts of a single company, the Harmony Mills, which had gained a monopoly on cotton manufacturing in Cohoes during the 1860s. This firm and the Cohoes Company grew to dominate most aspects of local commercial and civic life, and Cohoes was in no small measure a *de facto* company town. Harmony Mills employed thousands of operatives and managed over 800 tenement houses for its employees; the Cohoes Company owned the preponderance of the town's industrial land and provided nearly all its power. Overlapping boards of directors ran the two companies, their members drawn from the same small pool of wealthy, native-born Cohoes and New York City men who also ran the city's banks, woolen mills, water works, and government, as well as many of Cohoes's religious, fraternal, and charitable organizations. About one in four local residents worked in the cotton mills in 1860; by 1880, the proportion had risen to about one in three. Roughly three-fifths of mill operatives were women, and the number who were immigrants increased from about 70 percent to just under 90 percent

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1811-1918," in *A Report of the Mohawk-Hudson Area Survey*, Smithsonian Studies in History and Technology 26, ed. Robert M. Vogel (Washington, D.C.: Smithsonian Institution Press, 1973), 122.

<sup>27</sup> Masten, *History of Cohoes*, 264.

<sup>28</sup> Rezneck, "Cohoes," 122.

<sup>29</sup> "Our state institutions — VI. Manufactories at Cohoes," *New York Times*, Nov. 29, 1871, 5.

between 1860 and 1880. Initially, most local immigrants were Irish, but their numbers were almost equaled by an influx of French-Canadians in later decades.<sup>30</sup>

### The Cohoes Company

The Cohoes Company was incorporated in 1826 to develop the water power of the Mohawk River and lease it for industrial use. Engineer Canvass White conceived the idea for a power-canal system below the Cohoes Falls while working as one of the construction engineers on the Erie Canal. He mustered the support of businessmen from Albany and New York whose capital allowed the company to acquire enough land on both sides of the river to control nearly the entire water rights of the Mohawk from 1/2 mile above the falls to 1 mile below it. The company also bought about 500 acres in and around the settlement to offer for lease as factory sites.<sup>31</sup>

White's idea was to power factories and mills using water diverted from the river and delivered through tiers of canals. The outfall from mills at higher elevations in the system would water canals supplying factories at lower elevations. The plan required a dam on the river above the falls, which was finished in 1831. (The dam was carried away and rebuilt in 1832 and again in 1839 before being replaced by a still-extant stone masonry dam in 1865.<sup>32</sup>) The first of the company's canals opened in 1832 and 1834, before which time the company had arranged to use the Erie Canal to conduct water to its customers.

In 1835, the Cohoes Company advertized its "Whole head of Water" as 120', and the six levels of the system were each separated by falls of between 18' and 23'.<sup>33</sup> Plans to extend the company's uppermost canal (built in 1834) west into the village from its original termination near Lock 40 were disrupted in 1837 when the state determined that the enlarged Erie Canal should pass through the land the company held for this improvement. As a result, the directors petitioned the state legislature for a grant of those portions of the original canal to be

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<sup>30</sup> Rezneck, "Cohoes," 124; Daniel J. Walkowitz, "Working-class Women in the Gilded Age: Factory, Community and Family Life among Cohoes, New York, Cotton Workers," *Journal of Social History* 5, no. 4 (summer 1972): 470.

<sup>31</sup> J. H. French, *Gazetteer of the State of New York* (Syracuse: R. Pearsall Smith, 1860), 166; Bean, *City of Cohoes*, 11-12; Masten, *History of Cohoes*, 47-48, 51-52, 58, 63, 65-66. For additional information on the history and workings of the Cohoes Company's power-canal system, see Richard S. Allen, "Power Canals 1834-1880, Cohoes Company, Cohoes (HAER NY-9)," in *A Report of the Hudson-Mohawk Survey Area*, 113-16.

<sup>32</sup> Masten, *History of Cohoes*, 58, 73, 182.

<sup>33</sup> The 120' total head of water appears in most nineteenth-century descriptions of the power-canal system, but the actual power developed, calculated by adding together the falls between the individual levels in the system, was between 104' and 106'. *A Map of the Cohoes Village & Falls Exhibiting the Location of its Canals & Basins Giving Water Power which may be used to almost any extent on nearly all the adjoining Lots* (New York: Miller & Co. Lithographers, [1835]), copy in New York State Library; John Clowes, "Steam and Water as Motive Powers," *National Magazine and Industrial Record* 1, no. 5 (Oct. 1845): 445-46; Bean, *City of Cohoes*, 12-13; Masten, *History of Cohoes*, 66.

abandoned when the enlarged canal opened. They got it, and the state canal commissioners conveyed the land in 1843. The original line of the Erie Canal through Cohoes became parts of two levels in the Cohoes Company's power-canal system.<sup>34</sup>

The company's system was expanded from time to time and reached its fullest extent by the late 1870s with nine power canals and tunnels on six levels.<sup>35</sup> According to an advertisement printed in 1873, "The power [provided by the water] is leased by the Company, with land for factory buildings, in perpetuity, at an annual rental of about twenty dollars per horse power, and during the past few years, while most of the water powers in the country have failed for a time, Cohoes has had abundant supply, without one minute's stoppage. About one-third of this magnificent power is unappropriated, and appurtenant thereto are some of the finest factory sites to be found anywhere."<sup>36</sup> While the flow of the Mohawk may never have failed the company, the system was usually closed and emptied for a week each year to allow mill owners to make repairs while the canals were cleaned and maintained. "Fully 15,000 people, two-thirds of the population, will be idle during all this time," the *New York Times* reported before the August 1884 stoppage, but most would "take advantage of the shut down and visit their country cousins, go to the seashore, Round Lake, and other places."<sup>37</sup>

In 1911, traction and utility financier Anthony N. Brady set in motion the idea of replacing direct-drive water power in Cohoes with electricity. He (and his estate after 1913) acquired a controlling interest in the Cohoes Company, and set about constructing a hydroelectric plant on canal no. 1 above Harmony Mills. After this plant opened in 1915, the power canals were abandoned, and the Cohoes Company was consolidated with the Cohoes Gas Light Company in 1918 through acquisition by the recently formed Cohoes Power and Light Corporation. After years of general neglect, the disused power canals were filled in during the 1970s. Many

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<sup>34</sup> Arthur Masten, writing in 1876, described how the abandoned sections of the original Erie Canal were put to use by the Cohoes Company: "That part of the canal which ran east of the Harmony Mill between the Two Locks and the Three Locks became the second level in the system of the Cohoes Company, and may now be described as extending from just below the pump-house to the jute mill. The level of the Erie Canal between the Three Locks and the One Lock (White street) became the third [level] of the present system, having been united with the old Basin A [opened 1832] at a point near Factory street. . . . The remainder of the canal bed . . . became by degrees filled up . . ." Masten, *History of Cohoes*, 68-69, 76.

<sup>35</sup> Dwight Porter, "Report on the Water-power of the Hudson River Basin," in Census Office, *Reports on the Water-Power of the United States*, part 1 (Washington, D.C.: G.P.O., 1885), 364-66.

<sup>36</sup> Bean, *City of Cohoes*, 91.

<sup>37</sup> Quote from "A suspension of labor," *New York Times*, July 27, 1884, 7. See also "Out of work for a week," *New York Times*, Aug. 24, 1885, 1, which estimated that 10,000 people were idled by the 1885 stoppage.

sections of the system, such as that originally occupied by Locks 37 and 38, now serve as tunnels and utility rights of way beneath the city.<sup>38</sup>

### Harmony Mills

The Harmony Manufacturing Company was founded in 1835 by Peter Harmony, Hugh White, Stephen Van Rensselaer, Jr., and others, with many of the first stockholders already being investors in the Cohoes Company. The company's first mill, built by Joshua R. Clarke about 300' southwest of Lock 38 in 1837-38, made wide sheetings and print cloth; by 1847, its owners employed about 260 operatives whose work at 8,000 spindles and 220 looms consumed about 700 bales of cotton a year. The company never paid a dividend and was sold in 1850 to Alfred Wild of Kinderhook and Garner and Co. of New York City, who reincorporated it under the name Harmony Mills. In 1853, the new owners enlarged the original mill building, which eventually came to be known as Mill No. 1. Four years later, the first part of Mill No. 2 opened on property to the south. The balance of the building opened in 1866. The first half of Mill No. 3 opened in early 1868, and its second half opened in 1872. Harmony also expanded by buying other mill buildings in Cohoes. By 1876, Harmony Mills in all its parts employed over 4,000 workers at 258,054 spindles and 5,560 looms. It processed 29,250 bales of cotton and 5,600 bales of jute into, among other things, 79.5 million yards of printed, percale, wigan, and jaconet cloths that year. It was the largest cotton mill in the state in 1860, and by the 1880s it was "believed to be the largest establishment of its kind in the United States."<sup>39</sup>

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<sup>38</sup> B. R. Connell, "The Hydro-electric Development of the Cohoes Company at Cohoes, N.Y.," *General Electric Review* 18, no. 5 (May 1915): 340-41; "Petition of Cohoes Power and Light Corporation, Cohoes Company, and Cohoes Gas Light Company for Authority to Transfer Properties, etc.," Dec. 4, 1916, and decision of the Public Service Commission, Second District, Sept. 19, 1918, both in *Department Reports of the State of New York*, vol. 17 (Albany: J. B. Lyon Co., 1918): 415-25; "Cohoes Power & Light Issues \$2,500,000 Bonds," *Gas Age* (Feb. 1, 1919): 172; Resneck, "Cohoes," 125.

<sup>39</sup> Quote from *Fifth Annual Report of the Bureau of Statistics of Labor of the State of New York for the Year 1887* (Troy: Troy Press Company, 1888), 310; "The Harmony Mills," *Cohoes Cataract*, Oct. 4, 1856, 2; Bean, *City of Cohoes*, 15-18, 24; Masten, *History of Cohoes*, 67, 86, 242; French, *Gazetteer of the State of New York*, 166; Dwight Porter, "Report on the Water-power of the Hudson River Basin," in Census Office, *Reports on the Water-Power of the United States*, part 1 (Washington, D.C.: G.P.O., 1885), 367; Diana S. Waite, "Number 3 ('Mastodon') Mill 1868 and 1872, Harmony Manufacturing Company, Cohoes (HAER NY-8)," in *Report of the Hudson-Mohawk Survey Area*, 99-103.

Scale of operations at Harmony Mills, 1876<sup>40</sup>

	Operatives	Looms	Spindles
Mill No. 1	912	712	35,800
Mill No. 2	703	1,038	47,328
Mill No. 3	1,639	2,654	125,936
Mill No. 4 (former Ogden Mill)	403	632	30,276
Mill No. 5 (former Strong Mill)	220	330	14,424
Jute Mill	97	22	850
Bag Mill (former Van Benthuyssen paper mill)	147	92	3,440
	4,121	5,560	258,054

Harmony Mills' strong market position began to flag in the 1880s but recovered somewhat after the turn of the century. In 1910, a stock transfer brought the company under the joint control of the Draper Corporation and Saco-Lowell Company, who installed new machinery in the mills and reincorporated the company in Massachusetts. Competition from southern mills and the economic crisis of the 1930s reduced sales below sustainable levels, and the company was liquidated between 1932 and 1937. The mill buildings, sold at auction, have served a variety of light industrial purposes in the years since. Despite the loss of Mill No. 2 to fire in 1994 and many ancillary buildings to demolition, the complex remains substantially intact. The Harmony Mills complex, associated worker housing, and the upper portions of the Cohoes Company power-canal system were listed in the National Register of Historic Places as the Harmony Mill Historic District in 1978 and further designated the Harmony Mills National Historic Landmark District in 1999. The picker house, Storehouse No. 1, and the pump house are all recognized as contributing structures within the landmark district.<sup>41</sup>

### **The Cohoes Water Works**

The Cohoes Company built the village's first municipal water system in 1847-48. It provided domestic and fire-fighting service using water drawn from the uppermost level—canal no. 1—of the power-canal network. In 1855, a group of investors incorporated the Cohoes Water Works Company to improve and expand this system. The company hired James Slade, the city engineer of Boston (and, as such, the engineer in charge of the Boston Water Works) to design the improvements. Objections to the municipal water supply remaining in private hands led to the dissolution of the water-works company and the establishment instead of a village water commission in 1856, which started work to Slade's designs in 1857. The commissioners purchased the Cohoes Company's existing pipes and hydrants and negotiated a water rent to supply the expanded water works from the power canals. They contracted for the laying of

<sup>40</sup> Masten, *History of Cohoes*, 242. Mill No. 1, Mill No. 3, and the bag mill (renamed Mill No. 4 after the company disposed of its previous Mill No. 4 [the former Ogden Mill] sometime before 1911) all survive today.

<sup>41</sup> Rachel D. Bliven, et al., National Historic Landmark District Nomination for Harmony Mills, 1998, 5, 31-32.



extensive new piping and the construction of a 3-million-gallon reservoir on land purchased from Abram Lansing. The commissioners hired an engineer named Shepherd to superintend the work but dismissed him partway through and hired civil engineer David H. Van Auken to finish the project.<sup>42</sup>

At the start of the expansion, the village's water system contained 10,000' of pipe and nine fire hydrants. When the new work was completed in 1858, it contained 26,000' of newly laid pipe and forty-seven additional hydrants. Slade calculated that the 96' head created by the reservoir would supply "sufficient force to throw water over the highest buildings in the village," and a test on December 1, 1858, threw a stream "completely over Root's knitting mill without difficulty."<sup>43</sup>

The water works required a pump house to lift the water from power canal no. 1 to the reservoir. Fittingly, the flow of water from canal no. 1 into canal no. 2 would also be used to power the pump, just as it powered the mill engines in Harmony Mill No. 1 nearby. "It is proposed to use the present site of the old lock, just north of the Harmony Mills, for the pump-house," James Slade wrote in 1855. "By using this, we have the excavation ready made, and part of the material for the foundation already there, affording the means of building a suitable house at a very small cost."<sup>44</sup> The final cost increased, however, because the water commissioners, in consultation with the village trustees, expanded the building to include accommodations for a hose or fire-engine company. The two-story building was also designed to be large enough to contain a repair shop, commissioners' office, and a superintendent's apartment. "As a consequence," the commissioners reported, "the cost of the Pump House, so called, has considerably exceeded the original estimate [by about \$2,500], but it is believed the village will be amply remunerated by the rent which will be derived from the dwelling, the saving of renting an office for the Commissioners, the convenience of having some one always

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<sup>42</sup> "Cohoes Water Works Company," *Cohoes Cataract*, Aug. 11, 1855, 2; "Extracts from the report of James Slade, chief engineer of the water works," *Cohoes Cataract*, Aug. 18, 1855, 2; "Ground broke," *Cohoes Cataract*, Aug. 15, 1857, 3; "Water commissioners' report," *Cohoes Cataract*, Apr. 16, 1859, 3; "Village water works – length of water pipes laid in the several streets in said village," *Cohoes Cataract*, Apr. 23, 1859, 3; Masten, *History of Cohoes*, 128–31.

Brief biographical details for James Slade, who went on to design the water systems of Hartford, Conn., Baltimore, Md., and other places, appear in *Annals of the Massachusetts Charitable Mechanic Association, 1795–1892* (Boston: Rockwell and Churchill, 1892), 348, and *Supplemental Report of the Chief Engineer of the Washington Aqueduct*, 38th Congress, 1st sess., Mar. 22, 1864, S. Misc. Doc. 83, 30–31.

<sup>43</sup> Masten, *History of Cohoes*, 139; "Extracts from the report of James Slade, Chief Engineer of the Water works," *Cohoes Cataract*, Aug. 18, 1855, 2; "Village water works – length of water pipes laid in the several streets in said village," *Cohoes Cataract*, Apr. 23, 1859, 3.

<sup>44</sup> "Extracts from the report of James Slade, chief engineer of the water works," *Cohoes Cataract*, Aug. 18, 1855, 2.

accessible at the Pump House, and the great saving in expense in having new pipes lined, or old ones repaired under the immediate supervision of the superintendent.”<sup>45</sup>

It is not clear which of the hose companies in Cohoes occupied the engine-house portion of the building, or even if one moved in at all. Two accounts of the city’s engine companies, one from 1876 and one from 1886, do not list one located on Mohawk Street.<sup>46</sup>

Carpenter Philo B. Ferguson and mason John McEnerny built the combined pump and engine house under the supervision of local builder Joshua R. Clark. It cost about \$6,600, \$300 of which – the approximate cost of the hose company space – was reimbursed to the water fund by the village. Inside, the building contained a pump powered by a 45-horsepower Jonval turbine water wheel.<sup>47</sup> *The Cohoes Cataract* noted,

The Pump is a horizontal double-acting piston pump, having a five feet stroke, with a cylinder 10 1/4 inches in diameter, a cast iron air chamber 3 feet in diameter and 9 feet in height. The pump is calculated to work at a speed of 14 to 16 revolutions per minute, and is capable of being run at a speed of 18 revolutions. At a safe and moderate speed, it will throw 30,000 gallons of water per hour; it weights of itself 15 tons and rests upon a most substantial stone structure.”<sup>48</sup>

Fuller and Safely’s Cohoes Iron Foundry and Machine Shop built the pump and wheel to designs by Emile Geyelin, a prominent Philadelphia mechanical engineer whose work was installed in numerous mills and municipal water works across the country during the second half of the nineteenth century.<sup>49</sup>

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<sup>45</sup> Quote from “Water commissioners’ report,” *Cohoes Cataract*, Apr. 16, 1859, 3. See also “Water commissioners – treasurer’s report,” *Cohoes Cataract*, Apr. 23, 1859, 3.

<sup>46</sup> Masten, *History of Cohoes*, 259; William J. Johnson, “History of the City of Cohoes,” in *Bi-Centennial History of Albany. History of the County of Albany, N.Y., from 1609 to 1886*, ed. George R. Howell and Jonathan Tenney (New York: W. W. Munsell & Co., 1886), 967.

<sup>47</sup> Masten, *History of Cohoes*, 140; “Water commissioners’ report,” *Cohoes Cataract*, Apr. 16, 1859, 3; “Water commissioners – treasurer’s report,” *Cohoes Cataract*, Apr. 23, 1859, 3.

<sup>48</sup> “Water commissioners’ report,” *Cohoes Cataract*, Apr. 16, 1859, 3.

<sup>49</sup> Emile Geyelin also designed the water turbines installed in the first section of Harmony Mill No. 2 in 1857; “Jonval Turbines of three hundred horse power, erected at the New Harmony Mills, Cohoes, N.Y.,” *Journal of the Franklin Institute* 36, no. 3 (Sept. 1858): 164.

A 10" main led from the pump house to the reservoir. A subsidiary 10" main was laid from the pump house to the distribution pipes, allowing water to be sent directly into the village if needed, bypassing the reservoir.<sup>50</sup>

A new 100-hp Jonval turbine water wheel and a second pump were installed in the pump house in 1869–70 to supply a second 8 million-gallon reservoir added to the system southwest of the original reservoir. The original pump and water wheel remained in service feeding the first reservoir. Fuller and Safely built the new turbine. The new pump, however, soon proved unsatisfactory and was replaced with one built under the supervision of David H. Van Auken. The water works was expanded again in 1883 by the laying of new mains, and two Flanders pumps replaced the existing equipment in the pump house. Subsequently, a third reservoir and a gravity filtration plant were added to the system, and additional generations of pumps have been accommodated in the pump house.<sup>51</sup>

## Part II. Structural / Design Information

### A. General Description

**1. Character:** The site of Locks 37 and 38 has been transformed over time into a utility tunnel—a masonry-vaulted conduit for sewer lines underneath a range of nineteenth-century buildings. The tunnel retains the alignment and width of the two locks, and some of their stonework remains to provide some small evidence of the quality and character of materials and workmanship that went into the original Erie Canal in this part of the state. The site is more a testament to the industrial development that followed after the canal, with the homely picker house and storehouse representing the first steps in the cotton milling process and the pump house speaking to population growth and civic investment in nineteenth-century Cohoes.

**2. Condition of Fabric:** The structures on the site are stable but show signs of decay from years of limited maintenance and sporadic occupancy. The tunnel, once filled with canal water and now subject to ground-water seepage, shows weathering to its brick and stone. The pump-house interior, which is maintained by the city and shows signs of having been updated and

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<sup>50</sup> "Extracts from the report of James Slade, chief engineer of the water works," *Cohoes Cataract*, Aug. 18, 1855, 2.

<sup>51</sup> The replacement pump built under the supervision of Van Auken was double acting with a 6' stroke. Working ten strokes a minute, it could raise a 16" column of water 120' per minute. The 1883 pumps had a lift capacity of 6 million gallons every 24 hours. Bean, *City of Cohoes*, 72; Masten, *History of Cohoes*, 203; Johnson, "History of the City of Cohoes," 968. A Dean pump and the potential purchase of a Worthington pump are mentioned in "Motors use much of filtered water," *Municipal Journal* 32, no. 20 (May 16, 1912): 769. A photo of the horizontal plunger pump installed in the building by 1920 appears in Creed W. Fulton, "Modern Pumps for Small Water Works," *Journal of the New England Water Works Association* 34, no. 1 (Mar. 1920): 7.

rebuilt a number of times, is in the best condition of any part of the site; in contrast, the roof beams over the second floor of the picker house are beginning to fail from years of vacancy and neglect. The first floor of the picker house and the interior of the storehouse are in better repair due to recent use as a self-storage warehouse and an auto-body shop, respectively.

**B. Construction:** The locks and original canal prism were constructed directly on the shale bedrock, which is near ground level in this area. The bottom of the locks once comprised a plank floor laid atop a series of timber sleepers. Pockets cut into the bedrock to hold these sleepers remain visible in the tunnel. The lock walls were formed of dressed stone blocks. Only a few courses of this stone survive in each lock at either end of the tunnel. Historic sources consistently report that Lock 37 was built of limestone – the predominant material for locks on the Erie Canal – and Lock 38 was constructed of marble. Surviving evidence of the locks' working features includes recesses in the bedrock where the pockets for the downstream gates of Lock 37 once stood, and rectangular openings that may be the remains of filling culverts or ground sluices at the upstream end of the same lock.<sup>52</sup>

Examination indicates the level of the floor in the tunnel was lowered at some date by excavating out 6' or 7' of bedrock below the level of the lock walls. Most of this depth has subsequently been backfilled with 3'–4' of earth. Two sewer lines of differing dates lie in the bottom of the excavation under the backfill. The date when the floor was lowered is unknown; it is also not clear if it was lowered all at once or in stages as different generations of power-canal, waterworks, or sewer construction required a deeper cut.

The walls of the tunnel above the bedrock comprise roughly coursed stone blocks. In places the walls have been reinforced with cast-in-place concrete walls. The most substantial of these has five irregularly spaced buttresses and runs 82' along the east wall under the picker house. A shorter section of concrete wall extends north from this buttressed wall, and two additional small sections of concrete reinforcement appear on the west wall beneath the storehouse and along the transition from the storehouse to the picker house.

A course of cut-stone blocks runs for some distance along the tunnel's east wall under the storehouse, an area formerly located within the pound between Locks 37 and 38. Seen in

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<sup>52</sup> Ground sluices are culverts that channel water into a lock chamber from the pound above. They are typically controlled by some sort of gate or valve. Although used on some British canals in the eighteenth and nineteenth centuries, they were uncommon in American canals, where it was more common to fill locks using valves or wickets incorporated directly into the timber lock gates. This approach caused turbulence in the chamber, but gate-mounted valves were cheaper to construct and easier to maintain than ground sluices. Nevertheless, General Cocke (see quote on page 5 and footnote 8) noted in 1823 the use of ground sluices on the Erie Canal, and Lock 37 seems to support his observations. In contrast, ground sluices do not appear in the large number of enlarged Erie Canal locks (built between 1836 and 1862) that survive today.

conjunction with the single lock blocks that appear irregularly throughout the tunnel and in building foundations elsewhere in the neighborhood, these blocks demonstrate that lock stone was freely and liberally reused as necessary to reconfigure the channel after it became a power canal.

The tunnel is vaulted for most of its length. At its north end, cut-stone vaulting underlies the pump house. Brick vaulting lies under the storehouse and the southernmost 22'-8" of the picker house. No vaulting lies beneath the balance of the picker house, and steel beams that now support its first floor can be seen from the tunnel. A crawlspace under the western half of the building is also visible from the tunnel. The crawlspace is screened from the tunnel by a row of twelve brick piers that rest on the tunnel's west wall. The southernmost five piers are straight-sided and may once have formed foundations for heavy machinery in the house above. The northernmost seven piers are battered with stone caps; although they, too, may once have supported machinery, they now support an I-beam under the floor beams. The remains of a brick arch spring from a partition wall that runs between these two groups of piers. The arch and wall probably supported an earlier floor composed of wood structural members laid parallel to the line of the tunnel.<sup>53</sup>

A sluice or culvert enters the tunnel from the west about 120' south of the tunnel entrance. It features stone walls founded directly on the bedrock and is covered by brick vaulting. It has collapsed and is blocked off 25' beyond where it meets the tunnel. It may be the remains of the bypass sluice for Lock 37, or it may be a tailrace through which water once exhausted from the turbines in the pump house. The south face of the culvert has two parallel horizontal recesses about 4" high by 4" deep built into the stonework; these hold the remains of rotted timbers. Similar recesses extend from the culvert mouth 110' down the west side of the tunnel. The timbers in these recesses would originally have been near the bottom of the power canal; their purpose is now unclear. They may have served as rub-rails, or they may have anchored plank sheathing installed to ease water-flow along the rough stone walls.<sup>54</sup>

A second culvert or recess cut into the bedrock also enters the tunnel through the west wall. This one lies under the south end of the pump house about 90' from the tunnel entrance. A 4'-diameter riveted iron pipe passes vertically through the recess 8' beyond the tunnel wall. This, too, may be a tailrace for the pump house.

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<sup>53</sup> Five modern concrete-block piers also appear in the crawlspace, supporting floor beams under the middle of the picker house.

<sup>54</sup> Plank channel linings were installed in power canals in Lowell, Lawrence, and Holyoke, Massachusetts, to reduce head losses caused by bank friction.

Finally, a substantial arched opening 12'-6" in diameter is built into the west wall 32' from the entrance. It is now walled off with stone blocks. This may also have been a tailrace for one of the pump house water turbines.

### **C. Operation:**

#### Canal locks

Locks 37 and 38 originally functioned to raise and lower boats from one level on the Erie Canal to another. Only a few features from these locks survive: ground-sluice outlets, a possible bypass outlet, pockets in the bedrock for foundation timbers, and cuts in the bedrock indicating the former location of the gate pockets for the downstream (south) gates of Lock 37. A stone block with a projecting iron bolt, located on the east wall of the tunnel near the lower end of Lock 37, is believed to be a remaining quoin stone.

#### Power canal

The power canal supplied water to factories throughout Cohoes. Few features in the tunnel distinguish it as a power-canal channel. The two parallel recessed channels for timber that run along the west side of the tunnel from the bypass-culvert opening to the foundations of the picker house may have anchored plank sheathing used to ease water-flow along the rough walls.

#### Pump house

One or more of the three openings into the tunnel through the west wall were likely tailraces for the flow of water from canal no. 1 into canal no. 2 after powering the water-works turbines.

#### Storehouse and picker house

The storehouse was built to store cotton bales. Doors for bringing them inside appear on the building's west side and an overhead travelling trolley system is still in place for moving bales from one end of the building to the other.

The second floor of the picker house contained machinery for breaking apart raw cotton and separating out dirt, "motes," stones, and other debris. The first floor contained blowing pipes supplying the processes on the floor above. A considerable amount of dust was created in these processes, and air circulated by the picking room fans was discharged into a basement dust room or "hole" where dust and lint could settle out of the exhausting air. The dust hole in this instance was over the canal and was fitted with a slatted floor that allowed the falling dust to be carried away by the water. The risk of fire in the picker house was great. One textbook called picker rooms "the most dangerous place in the mill, because of the foreign matter liable to be in cotton bales, and because of handling the cotton in loose

form.” Small pieces of iron or stones could create sparks in the fast moving picking machines; once the loose cotton was ignited, the machinery’s many fans would “furnish a blast like a blacksmith’s bellows.” Because of the risk, picker rooms were frequently placed in separate buildings as this one is, although at Harmony Mills most of the rooms were simply placed in dedicated wings separated by fire walls from the balance of the complex.<sup>55</sup>

**D. Site Information:** Farmland and forest formed the nearest neighbors to Locks 37 and 38 when they were new in the 1820s. By the time the site was incorporated into the power-canal system in 1843, it lay on the outskirts of a burgeoning village. It was the growth of industry and population in the village that led to the construction of mill buildings and a water works on the lock foundations during the 1850s and 1860s. By the mid 1870s, a vast mill complex and its attendant residential development completely encompassed the site, a condition that endured into the twentieth century. The closing of Harmony Mills in the 1930s reduced activity around the site, but it has remained urban despite the demolition of some of the surrounding mill buildings over time. The ongoing investment in adaptive reuse of the surviving mills may in the long run protect the site from further loss.

### Part III. Sources of Information

#### A. Primary Sources

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<sup>55</sup> D. A. Tompkins, *Cotton Mill Processes and Calculations* (Charlotte, N.C.: by the author, 1899), 21.

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Fig. 1. Harmony Mills (labeled 13-A, -B, -C, -D, and -F) sits above the Mohawk River in this detail from Galt and Hoy's 1879 bird's-eye view of Cohoes, N.Y. The two municipal reservoirs are visible in the upper half of the image. (From New York State Library cat. no. [74742] 1879 203-6719).